REMARKS

Regarding the Status of the Claims:

Claims 1, 2, and 7 – 9 are pending.

Claims 3 – 6 and 10 – 11 have been cancelled.

No Claims have been withdrawn from consideration.

Regarding the Claim Amendments presented in this reply:

The amendments to the claims add no new matter. The amendment to claim 1 finds support in the specification on page 8, lines 10 – 26.

Regarding the Claim Rejections:

The Office action rejects:

I. claim 4 under 35 U.S.C §112, second paragraph, and
II. claims 1, 2, 4 and 7 – 9 under 35 U.S.C §103(a) over EP 1011164 to Saito et al. (hereinafter, "Saito") and US 6,331,586 to Thielen et al. (hereinafter, "Thielen").

Regarding Rejection I:

Applicants respectfully submit that the rejection of claim 4 under 35 U.S.C §112, second paragraph should be withdrawn. This rejection is moot in light of the cancellation of claim 4.

Regarding Rejection II:

Applicants respectfully submit that the rejection of claims 1, 2, 4 and 7 – 9 under 35 U.S.C §103(a) over Saito and Thielen should be withdrawn.

Please note that, as currently amended, claim 1 requires the polymer blend to contain carbon fillers, comprising from 1 to 30 wt% of conductive black, from 5 to 60 wt% of carbon fibers, and from 1 to 25 wt% of carbon nanotubes, in each case based on the total weight of the polymer blend.

In paragraph [0012] Saito describes a separator for a fuel cell, formed using a base material obtained from a composition comprising at least:

1. a binder,

According to paragraphs [0016] to [0019], the binder used in the invention according to Saito has "no particular restriction" and can be chosen from a thermosetting resin, a thermoplastic resin, or a rubber. Since, Saito places "no particular restriction" on the binder, an infinite variety of possibilities are left open to a skilled artisan. A skilled artisan's selection would not be limited by the examples provided in Saito. Indeed, such limitation would be contrary to the express teaching of Saito that the binder has "no particular restriction."

The Office action makes much of the fact that amongst at least 59 examples of possible binders, Saito mentions polyethersulfone, polyamide and polyether ketone. However, Saito does not indicate a preference for the particular combination claimed in the present invention. The Office action acknowledges that Saito "does not expressly teach that the binder comprises a polymer blend which includes at least two mutually nonmiscible blend polymers in a co-continuous or intercalated structure, as recited in claim 1." Additionally, Saito does not teach that a combination of two non-miscible polymers, having different polarities, might be especially desirable. It cannot fairly be stated that a skilled artisan would have looked to Saito and found it obvious to choose the claimed species "from a finite number of identified, predictable solutions, with a reasonable expectation of success." *See*, *KSR v. Teleflex*, 82 USPQ 2d 1385, 127

S.Ct. 1727 (2007). Saito states that the binder has "no particular restriction." A skilled artisan would, therefore, have needed to select from an infinite variety of unidentified, unpredictable solutions. Any attempt to assert that the combination of components, now claimed, would have "stood out" to a skilled artisan is an improper reconstruction of the invention based on "knowledge gleaned only from applicant's disclosure."[1]

2. a powdery carbon filler,

According to paragraph [0020], the powdery carbon filler "has no particular restriction except the particle diameter, as long as the powdery carbon filler is a powdery carbon filler having excellent electroconductivity. Saito provides examples of suitable powdery carbon fillers in paragraph [0020], natural graphite (including scaly graphite or lumpy graphite), expanded graphite, artificial graphite, mesophase carbon, coal coke, petroleum coke, acetylene black, carbon black, Ketjen Black and glassy carbon. Saito does not provide an apparent reason to use nanotubes in combination with conductive black and carbon fibers as claimed in amended claim 1.

3. a short fiber.

According to paragraph [0022], the short fiber "is made from a material high in strength and modulus of elasticity and excellent in corrosion resistance, electroconductivity, heat resistance and electrochemical corrosion resistance. According to paragraph [0022], examples of short fibers are a carbon fiber, a pyralized carbon fiber (a flame retardant fiber) and a stable steel fiber.

The Office action cites Thielen only in an attempt to compensate for Saito's failure to disclose "that the binder comprise a polymer blend which includes at least two mutually nonmiscible blend polymers in a co-continuous or intercalated structure, as

[1] MPEP 2145, citing *In re McLaughlin* 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971).

recited in claim 1."[2] Thielen does not provide, and is not cited to provide, an apparent reason to use carbon nanotubes in combination with conductive black and carbon fibers as claimed in amended claim 1. The conductive polymer blend, according to Thielen, comprises at least one conductive material in particulate or fiber form. According to column 4, line 8 – column 5, line 43 of Thielen, carbon blacks or other carbon powders or aggregates are preferred as the finely divided conductive material. Examples include graphite, carbon black, vitreous carbon, activated charcoal, activated carbon, carbon fibers and mixtures thereof. In addition, the finely divided conductive material can be other conducted powders, fibers, aggregates or composite particles such as steel fibers, metal powders or flakes, organic semiconductor powders, metal-coated fibers, conductive metal oxide particles, inorganic particles coated with a conductive layer, etc. Again, Thielen does not provide an apparent reason to use carbon nanotubes in combination with conductive black and carbon fibers as claimed in amended claim 1.

Additionally, applicants maintain that a skilled artisan would have had no basis to predict the likelihood of successfully combining Saito and Thielen, because Thielen exemplify only very low amounts of carbon black, i.e., 1% by weight. The general teaching in column 10, line 35 (cited on page 5 of the Office action) that appropriate selection of the type of finely divided conductive material and its amount is important, does not provide a basis to predict the likelihood of successfully combining the references. The Office has the burden to demonstrate that the cited references obviate the claimed invention; Applicants do not have a burden to demonstrate that the cited references teach away from the claimed invention.

Unexpected Results

Moreover, the very specific combination according to amended claim 1 of the present application gives rise to bipolar plates showing improved characteristics. This can be seen in example 4 in the table on page 11 of the description of the present application, which is reproduced below for the Examiner's convenience.

[2] Page 3 of the Office action mailed April 10, 2008.

Examples	Blends	Specific conductivity [S/cm]	
		σ II4	σ ⊥4
2	10% PES, 40% PA6.6, 10% carbon black, 40% C fibers	14	6
3	30% PES, 23.25% PA6.6, 6.75% carbon black, 40% C fibers	21	4
4	50% PES, 32% PA6.6, 4% carbon black, 10% C fibers. 4% C nanotubes	3	0.11
5	30% PES, 22.5% PA6,6, 7.5% carbon black, 40% C fibers,	22	1.7

G II4: Conductivity in the plane of the plate
G I4: Conductivity perpendicular to the plane of the plate

In example 4, a bipolar plate comprising 50% polyether sulfone, 32% polyamide 6,6, 4% carbon black, 10% carbon fibers and 4% carbon nanotubes is prepared. Specific conductivities are measured giving values of 3 S/cm in the plane of the plate and 0.11 S/cm perpendicular to the plane of the plate.

Example 4 according to amended claim 1 of the present application therefore shows that the presence of the specific combination of conductive black, carbon fibers and carbon nanotubes gives rise to bipolar plates showing high specific conductivities in the plane of the plate and perpendicular to the plane of the plate.

In Conclusion:

The present application is in condition for allowance. Applicants request favorable action in this matter. In order to facilitate the resolution of any issues or questions presented by this paper, the Examiner is welcome to contact the undersigned by phone to further the discussion.

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Respectfully submitted,
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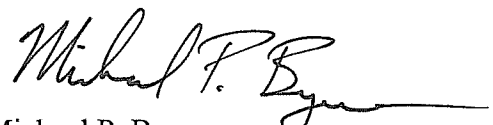

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